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PENSOFT

First record of *Phallotorynus victoriae* Oliveros, 1983 (Cyprinodontiformes, Poeciliidae) for Uruguay river basin and Rio Grande do Sul, southern Brazil

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Abstract

The first occurrence of *Phallotorynus victoriae* is reported from the Uruguay river basin associated with the grasslands of the Pampa Biome, southern Brazil. The record includes only one specimen from a tributary to Ibicuí River located in the municipality of Uruguaiana, Rio Grande do Sul state.

Key words

Biodiversity; Ibicuí basin; gonopodium; Pampa Biome; taxonomy.

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Introduction

Poeciliinae is broadly distributed throughout the Americas (Lucinda 2003) and comprises about 274 described species, 34 of those described in the last 10 years (Eschemeyer and Fong 2017). The genus *Phallotorynus* Henn, 1916 contains small poeciliids endemic to South America and known from Paraíba do Sul, Paraná, and Paraguay rivers (Lucinda et al. 2005). Currently, the genus comprises 6 valid species: *Phallotorynus dispilos* Lucinda, Rosa & Reis, 2005, *P. fasciolatus* Henn, 1916, *P. jucundus* Ihering, 1930, *P. pankalos* Lucinda, Rosa & Reis, 2005, *P. psittakos* Lucinda, Rosa & Reis, 2005, and *P. victoriae* Oliveros, 1983 (Eschemeyer and Fong 2017). *Phallotorynus victoriae* was recorded from the lower portions of Paraná river basin in Argentina, Brazil and Paraguay (Oliveros 1983, Lucinda and Reis 2005, Lucinda et al. 2005, Meyer and Etzel 2006, Eschemeyer et al. 2017). For the state of Rio Grande do Sul, 422 species are recorded (Bertaco et al. 2016) and with 9 of those belonging to the Poeciliidae: *Cnesterodon brevirostratus* Rosa & Costa, 1993; *C. decemmaculatus* (Jenyns, 1842); *Cnesterodon* sp. n. A; *Cnesterodon* sp. n. B; *Phalloceros caudimaculatus* (Hensel, 1868); *P. heptaktinos* Lucinda, 2008; *P. spiloura* Lucinda, 2008; *Phalloptychus iheringii* (Boulenger, 1889); and the introduced *Poecilia vivipara* Bloch & Schneider, 1801. The genus *Phallotorynus* has not been recorded from the Rio Grande do Sul state to date and neither from the Uruguay river basin. Thus, the first record of *Phallotorynus victoriae* from Rio Grande do

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Figure 1. Male of *Phallotorynus victoriae*, UFRGS 23645, 15.3 mm SL, captured in Uruguay river basin, Rio Grande do Sul, Brazil. Left to right image for better visualization of the gonopodium. Scale bar = 2 mm.

Sul state, southern Brazil and from the Uruguay river basin is reported here, which suggests a broader distribution for this species.

Methods

The specimen of *Phallotorynus victoriae* (Fig. 1) was collected in Ipané stream, a tributary of Ibicuí, 10 km from road BR 472 under the São João Arregui bridge (29°29′53″ S, 056°35′43″ W, 61 m above sea level, Fig. 2), located in the municipality of Uruguaiana, Rio Grande do Sul, Brazil. The specimen was fixed in 10% formalin, later transferred to 70% alcohol, and deposited at the collection of fishes of Laboratory of Ichthyology of Universidade Federal do Rio Grande do Sul (UFRGS) under the following voucher number: UFRGS 23645, 1 specimen, male, 15.3 mm standard length (SL). Measurements follow Lucinda et al. (2005) and were made with a digital caliper reading to the nearest 0.1 mm. Distribution map was made with the software Quantum GIS v. 1.8.0 (Scherman et al. 2005).

Results

New record. Brazil, Rio Grande do Sul, Uruguay basin, Ibicui River (29°29′53″ S, 056°35′43″ W), Junior Chuc-

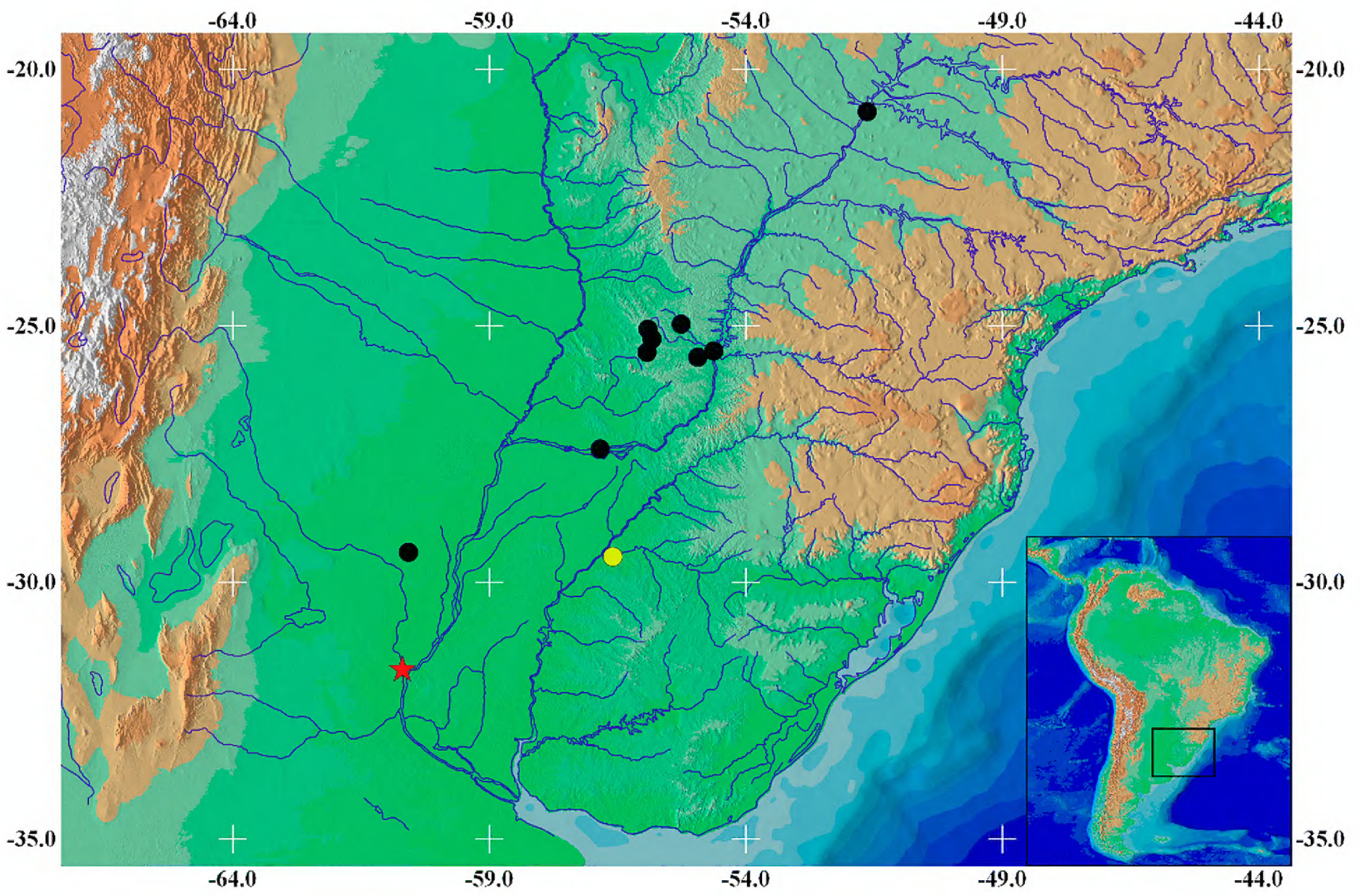

Figure 2. Previous known distribution of *Phallotorynus victoriae* including Paraná and Paraguay river basins (black circles; red star is the type locality), and the new record (yellow circle) from Uruguay river basin, municipality of Uruguaiana, Rio Grande do Sul, Brazil. Previous distribution records from Lucinda et al. (2005).

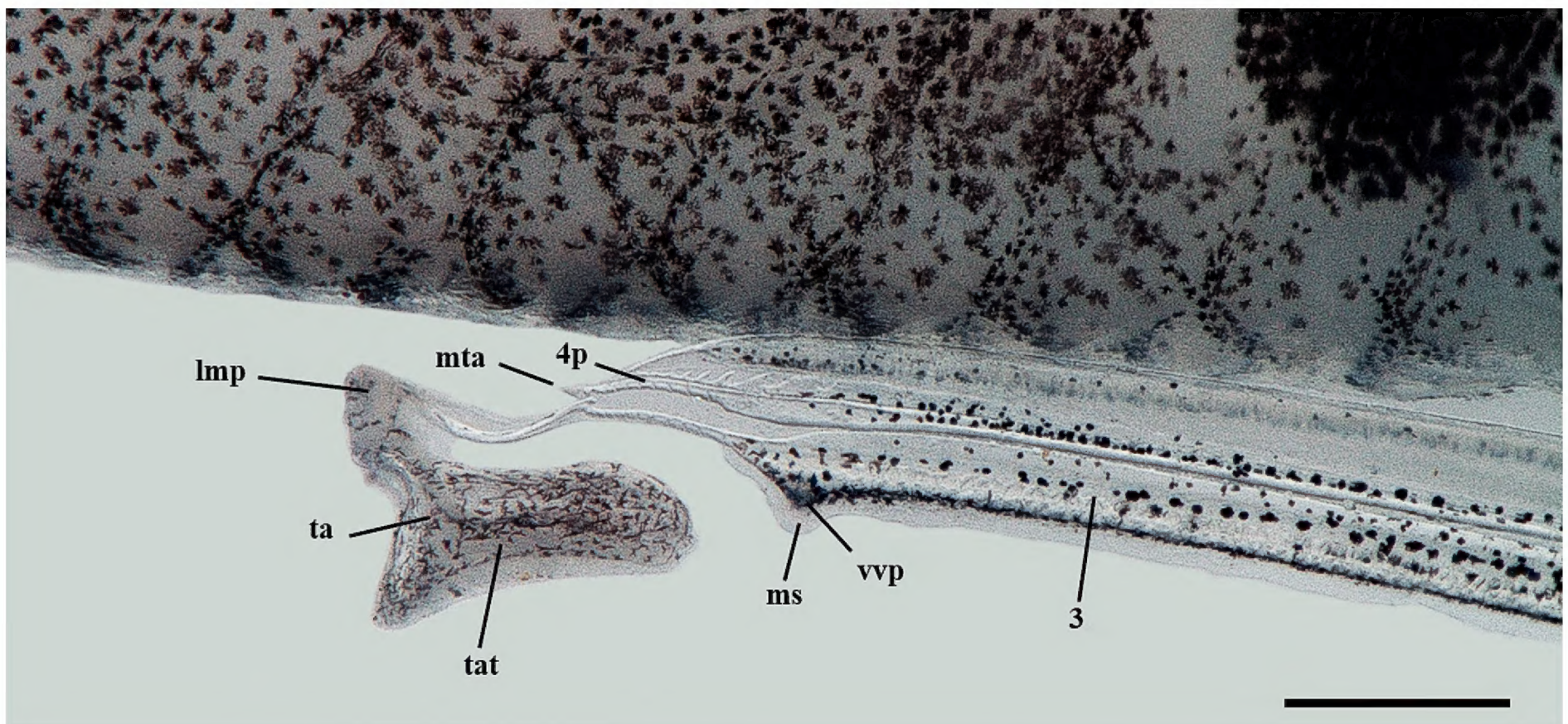

Figure 3. Gonopodium of *Phallotorynus victoriae*, UFRGS 23645, 15.3 mm SL. Arrows indicate the gonopodium rays (3, 4p), V-shaped ventral projection (vvp) on the distal portion of ray 3; trowel-like appendix at the tip (tat) of ray 3; large membrane on pedicel (lmp) of gonopodium; membranous tip anterior (mta) to 4 and 5 rays; membranous sheath (ms) and terminal appendix (ta). Scale bar = 0.5 mm.

taya, Laura M. Donin, Tiago P. Carvalho, Carolina S. Vieira, Luiz R. Malabarba, 9 July 2017, UFRGS 23645, 1 individual.

Identification. Lucinda et al. (2005) diagnosed *Phallotorynus* as having the following features in the gonopodium: V-shaped ventral projection on distal portion (vvp) of ray 3; trowel-like appendix at tip (tat) of ray 3; large membrane on pedicel (lmp) of gonopodium; membranous tip anterior (mta) to rays 4 and 5. All these features were observed in the gonopodium of the *P. victoriae* specimen (Fig. 3). *Phallotorynus victoriae* is distinguished from *P. fasciolatus*, *P. dispilos*, *P. jucundus*, and *P. pankalos* by color pattern (1 vs 2–9 spots on the lateral portion of body). *Phallotorynus victoriae* is distinguished from *P. psittakos* by the number of gonopodial rays (8 vs 9). The morphometric characters are shown in Table 1.

Discussion

In poecilids, the gonopodium plays a very important role in the copulation process and used as a diagnostic feature within the family (Chambers 1987, Chambers 1990, Lucinda et al. 2005, Lucinda and Graça 2015). According to Chambers (1987), the length of the gonopodium relative to the standard length varies markedly amongst the genera of Poeciliidae, forming 2 main groups: the first group formed by species with longer gonopodia (50–70% of SL). The gonopodium base is inserted just posterior to a vertical from the pectoral fin base (e.g. *Poeciliopsis*, *Phallichthys*, *Cnesterodon* and *Heterandria*). The second group are species with short gonopodia (33% or less of SL). The gonopodium base is anteriorly situated, almost between the pelvic fins at or about a vertical drawn from the dorsal fin origin (e.g. *Alfaro*, *Poecilia*, *Priapella*, *Belonesox* and *Xiphophorus*). *Phallotorynus* may be categorized in the second group, with length of the gonopodium of 36% of SL, which is lower than that recorded for the first group.

Morphometric analysis of the specimen (Table 1) shows a lower body depth than that recorded by Lucinda et al. (2005), showing that this species has a greater range of variation in this measurement, as recorded for *Phallotorynus fasciolatus* (23.6–32.1% of SL).

All *Phallotorynus* species have not yet been assessed for the IUCN Red List, but in Brazil, *P. fasciolatus* and *P. jucundus* are considered Endangered (ICMBio 2016). *Phallotorynus victoriae* is known from several places (Lucinda et al. 2005) and has an Extent of Occurrence exceeding 20,0000 km^2. Although this species seems rare and is known only in habitats with intact riparian vegetation, based on its wide distribution along the Paraná and

Table 1. Morphometric characters of males of *Phallotorynus victoriae*. Measurements 1–10 are percent of standard length and measurements 11–13 are percent of head length.

	Present study	Lucinda et al. 2005 (*n* = 11)	
		Range	Mean
Standard length (mm)	15.6	14.4–17.6	16.3
1. Head length	22.2	21.6–23.8	22.5
2. Snout-occipital	18.7	16.9–19.4	18.1
3. Pre-dorsal distance	58.1	56.6–59.8	58.1
4. Dorsal-fin base length	12.6	9.4–12.9	11.3
5. Anal-fin base length	8.3	6.9–10.1	8.2
6. Body depth	27.0	28.8–33.6	30.8
7. Pre-pelvic length	30.8	30.4–34.4	32.3
8. Prea-nal length	41.2	38.2–42.2	40.2
9. Post-anal length	60.6	54.4–60.8	56.0
10. Caudal peduncle depth	12.8	12.3–15.6	14.0
11. Snout length	22.8	17.6–24.9	21.5
12. Orbital diameter	39.6	39.0–45.7	43.0
13. Post-orbital length	41.9	34.5–47.3	39.8

Uruguay rivers, this species can be classified as Least Concern using IUCN criteria (IUCN 2017).

Finally, this record suggests that although the Uruguay river basin is relatively well known, there are still unexplored habitats, where there may be species not yet reported, such as the recently reported *Ctenobrycon* cf. *alleni* (Eigenmann & McAtee, 1907), *Serrapinnus kriegi* (Schindler, 1937), and *Laetacara dorsigera* (Heckel, 1840), which were known from Paraguay and Paraná river basins (Bertaco et al. 2016). Therefore, this study is the first record of the genus *Phallotorynus* and extends the distribution of *P. victoriae* in the Uruguay river basin and the state of Rio Grande do Sul.

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Authors' Contributions

JC, LMD, CSV and TPC collected the specimens; TPC, LMD and JC examined and identified the specimen; DFF, LMD and JC prepared the figures. All authors prepared, reviewed, finalized, and approved the manuscript.

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